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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/646,007	08/22/2003	Rudolf Neumuller	ZAHFRI P532US	8962
20210	7590	09/26/2005	EXAMINER	
DAVIS & BUJOLD, P.L.L.C. FOURTH FLOOR 500 N. COMMERCIAL STREET MANCHESTER, NH 03101-1151			ROSENBERG, LAURA B	
			ART UNIT	PAPER NUMBER
			3616	

DATE MAILED: 09/26/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/646,007

Applicant(s)

NEUMULLER ET AL.

Examiner

Laura B. Rosenberg

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 11 July 2005.
- 2a) ☒ This action is FINAL. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 12, 13 and 16-22 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 12, 13 and 16-22 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                        | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)    | Paper No(s)/Mail Date. _____  |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____   | 6) <input type="checkbox"/> Other: _____                                    |

### **DETAILED ACTION**

1. This office action is in response to the amendment filed 11 July 2005, in which claims 12 and 19-21 were amended, and claims 14 and 15 were canceled.

### ***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 12, 13, and 16-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Varela et al. (6,886,655) in view of Tanzer et al. (6,095,005), further in view of Singer (3,150,531). Varela et al. disclose a gantry axle (including #84, 90) comprising:

- Driven differential gear unit (not shown, but is old and well known in the art that a driven differential gear unit is needed in a drive unit assembly to transfer torque between the drive unit and the driven axle; further supported by driven differential gear unit #10 in Tanzer et al.)
- Axle shaft (including #114)
- Gantry transmission (including #96)
- Vehicle wheel (#106) rotatable about an axis of rotation (#94)
- Ground (#88)

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- Input spur gear (#112) driven by the axle shaft and rotatable about an axis of rotation (#92)
- First (#118) and second (#120) intermediate spur gears rotatable about an axis of rotation (#124)
- Output spur gear (#116) connected with the vehicle wheel and rotatable about the vehicle wheel axis of rotation (#94)
- Vertical spacing of input spur gear axis of rotation (#92) to the ground is smaller than a vertical spacing of intermediate spur gears axis of rotation (#124) to the ground and is smaller than a vertical spacing of output gear axis of rotation (#94) to the ground (best seen in figure 7; column 5, lines 10-17)
- Input spur gear axis of rotation (#92) is spaced from the intermediate spur gears axis of rotation (#124; best seen in figure 7)
- Intermediate spur gears axis of rotation (#124) is spaced from the output gear axis of rotation (#94; best seen in figure 7)
- Axle shaft (#114) is situation on an upper inner limit of an axle bridge (not labeled, but best seen in figure 6)
- Input spur gear (#112) is mounted in a housing (#98) of the gantry transmission (#96)
- Ratio between the input spur gear (#112) and the first intermediate spur gear (#118) is about 2.2 (best seen by counting gear teeth in figure 7)
- Ratio between the second intermediate spur gear (#120) and the output spur gear (#116) is about 1.8 (best seen by counting gear teeth in figure 7)

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- Horizontal spacing between the output spur gear axis of rotation (#94) and the input spur gear axis of rotation (#92) is about 30mm (#D3; while figure 7 may not be drawn to scale, if #D2 is between 180-230mm, then #D3 would be about 30mm)
- Vertical spacing between the output spur gear axis of rotation (#94) and the input spur gear axis of rotation (#92) is about 189mm (#D2; between 180-230mm; column 5, lines 17-18)
- Axle bridge is situated offset in a travel direction relative to the vehicle wheel axis of rotation (though not shown in figure 7, axle bridge is the housing that surrounds axle #114, and thus would be offset in a travel direction relative to the vehicle wheel axis of rotation #94)

The examiner notes that a ratio between gears is simply determined by dividing the number of teeth of the larger gear by the number of teeth of the smaller gear. Further, Varela et al. disclose adjusting the diameters of the gears, which would affect the number of gear teeth, in order to reach a desired gear reduction for a specific vehicle application (column 4, lines 61-67).

Although it is old and well known in the art that springs are used to connect an axle with a vehicle chassis, Varela et al. do not specifically disclose this feature.

Further, Varela et al. do not disclose the spur gears having helical cut teeth.

Tanzer et al. teach a gantry axle (best seen in figure 2) comprising:

- Driven differential gear unit (#10)
- Axle shaft (including #18, 20)
- Gantry transmission (best seen on left side in figure 2)

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- Vehicle wheel (#50) rotatable about an axis of rotation (not labeled; central axis through output shaft #44)
- Input spur gear (#76) driven by the axle shaft and rotatable about an axis of rotation (not labeled; central axis through input shaft #20)
- Output spur gear (#82) connected with the vehicle wheel and rotatable about the vehicle wheel axis of rotation (best seen in figure 2)
- Vertical spacing of input spur gear axis of rotation to the ground is smaller than a vertical spacing of output gear axis of rotation to the ground (best seen in figure 2)
- Spur gears have helical cut teeth (column 2, lines 63-64)
- Spring carriers (including #58, 62) connect the gantry axle with the vehicle chassis and are connected with the gantry transmission (via sleeve #56)

It would have been obvious to one skilled in the art at the time that the invention was made to modify the spur gears of Varela et al. to include helical cut teeth as claimed in view of Tanzer et al. so as to provide high contact ratio teeth (Tanzer et al.: column 2, lines 63-64). Further, it would have been obvious to one skilled in the art at the time that the invention was made to modify the gantry axle of Varela et al. to include spring carriers as claimed in view of Tanzer et al. so as to secure the axle and wheel with the vehicle chassis while supporting the vehicle chassis and absorbing shock (Tanzer et al.: column 2).

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Varela et al. do not specifically disclose a sloping angle of the gear teeth of the intermediate gears being designed so that the axial forces of the intermediate spur gears are substantially neutralized.

Singer teaches a gantry axle (#10) comprising:

- Driven differential gear unit (within casing #12)
- Axle shaft (including #22)
- Gantry transmission (including #20)
- Vehicle wheel (#48) rotatable about an axis of rotation (not labeled; central axis through output shaft #32)
- Input gear (#25) driven by the axle shaft and rotatable about an axis of rotation (not labeled; central axis through input shaft #22)
- Output gear (#36) connected with the vehicle wheel and rotatable about the vehicle wheel axis of rotation (can be seen in figure 4)
- Vertical spacing of input gear axis of rotation to the ground is smaller than a vertical spacing of output gear axis of rotation to the ground (best seen in figure 4)
- Sloping angle of the gear teeth are designed so that axial forces of the gears are substantially neutralized (column 3, lines 59-68)

It would have been obvious to one skilled in the art at the time that the invention was made to modify the gears of Varela et al. to include a sloping angle of the gear teeth as claimed in view of Singer so as to neutralize the stresses encountered by the

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axle when the vehicle is fully loaded, thus extending the useful life of the axle and producing less wear and stress on the gears (Singer: column 3, lines 59-68).

### ***Response to Arguments***

4. Applicant's arguments filed 11 July 2005 have been fully considered but they are not persuasive.

In regards to pages 8-11 and the Tanzer reference, the examiner maintains that Tanzer teaches the use of helical cut teeth in a gantry axle configuration, and she has provided proper motivation for this combination of prior art references. Further, modifying the gantry transmission of Varela et al. to include helical cut teeth would not negatively affect the transmission, and it is clear how this feature could be applied to the Varela et al. transmission.

In regards to pages 11-4 and the Singer reference, Singer specifically teaches the use of gear teeth with a sloping angle that neutralize axial forces (column 3, lines 59-68), as set forth in applicant's newly amended claim 12. An additional benefit of this configuration is the extension of useful life of the axle and less wear and stress produced on the gears. Thus, Singer is an appropriate reference for this teaching. Further, the examiner notes that the sloping angle of the teeth has not been claimed to be with respect to any other feature of the claimed invention, and thus can be read in many ways. For instance, the sloping angle could be with respect to a line extending through the center of the gear's rotational axis, or it could be the angle of one set of gear teeth with respect to another set of gear teeth, or various other interpretations.



***Conclusion***

5. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

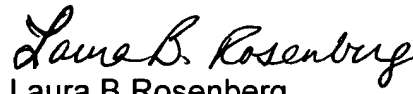
A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Laura B. Rosenberg whose telephone number is (571) 272-6674. The examiner can normally be reached on Monday-Friday 7:00am-3:30pm.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Paul Dickson can be reached on (571) 272-6669. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
Laura B Rosenberg  
Patent Examiner  
Art Unit 3616

LBR

 9/22/05  
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